NEM SCHEDULING ERROR

1 DECEMBER 2014 TO 13 JANUARY 2015 –

INCORRECT 66 KV LINE RATINGS IN VICTORIA

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AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

IMPORTANT NOTICE

Purpose

AEMO has prepared this report using information available as at 06 August 2014, unless otherwise specified.

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1. SUMMARY

AEMO has determined that a scheduling error has occurred because incorrect ratings were applied for three 66 kV transmission lines connecting Ballarat and Horsham in Victoria.

The scheduling error occurred over six weeks during the 2014-15 summer, from 01 December 2014 to 13 January 2015. Hand-dressed winter ratings were applied instead of the summer ratings during this period.

Hand-dressed limits are those applied manually to overwrite automatically-generated rating values elicited from the Energy Management System database every five minutes.

The ratings for the three 66 kV lines, namely Ballarat North–Buangor, Ararat–Buangor and Ararat–Stawell, have an impact on six constraint equations that manage flow on the three lines for the trip of the parallel Ballarat–Waubra–Horsham 220 kV line.

Normally the summer ratings would be applied over summer. In this situation, however, hand-dressed winter ratings were applied that increased the loading on the three lines. While this did not affect system security, the limits (right hand side (RHS)) of the affected constraint equations would have been lower if the summer ratings were applied, which means the three lines would have been able to operate at a lower loading.

Under NER clause 3.16.2(a), Market Participants affected by a scheduling error may apply to the dispute resolution panel established under NER clause 8.2.6A for a determination of compensation.

2. DESCRIPTION OF THE ERROR

2.1 Background

As part of AEMO's declared network functions in Victoria, AEMO conducts a quality assurance review of changes to equipment ratings, advised by Victoria's Network Service Providers (NSPs). AEMO assesses the reasonability of rating changes and seeks confirmation from NSPs. Once AEMO is satisfied that the rating changes are reasonable, they are entered into the Ratings Workbook for Victoria. A peer review of the new ratings diminishes the possibility of errors before AEMO loads them into the Energy Management System (EMS) database. From there, the new ratings are loaded into the pre-production environment and verified for another week before being loaded into the production environment. The ratings are then input to constraint equations used to determine dispatch targets for generating units and interconnectors.

Under certain circumstances, however, AEMO is advised of urgent changes to equipment ratings by the NSPs. To meet this urgency, and to avoid the delays implicit in the longer quality assurance review, AEMO can apply an interim manual hand-dressing of the new ratings into the EMS. The hand-dressing overwrites the ratings that are input to constraint equations from the EMS database. It is removed after the normal quality assurance review is complete and the new ratings are loaded into the production environment.

2.2 Cause of the Error

In August 2014, Powercor advised AEMO of changes to the ratings[1] for Ballarat North–Buangor, Ararat–Buangor and Ararat–Stawell 66 kV lines. Table 1 and Table 2 list the winter and summer[2] ratings applicable before and after August 2014.

Table 1 Winter rating for the 66 kV lines before and after August 2014

66 kV lines	Winter Day[3] rating (before August 2014)	Winter Day rating (after August 2014)	Winter Night[4] rating (before August 2014)	Winter Night rating (after August 2014)
Ballarat North–Buangor	40.6 MVA	34.9 MVA	49.2 MVA	40 MVA
Ararat–Buangor	54.3 MVA	47.4 MVA	60.6 MVA	48 MVA
Ararat–Stawell	49.7 MVA	43.4 MVA	56 MVA	44.6 MVA

Table 2 Summer rating for the 66 kV lines before and after August 2014

66 kV lines	Summer Day rating (before August 2014)	Summer Day rating (after August 2014)	Summer Night rating (before August 2014)	Summer Night rating (after August 2014)
Ballarat North–Buangor	36 MVA	25.7 MVA	46.9 MVA	34.3 MVA
Ararat–Buangor	53.2 MVA	45.7 MVA	60 MVA	46.9 MVA
Ararat–Stawell	46.3 MVA	38.3 MVA	49.2 MVA	41.7 MVA

Based on Powercor's advice, on 6 August 2014, AEMO manually hand-dressed the ratings for the three lines to their winter day ratings, as these were relevant at the time. Table 3 lists the hand-dressed ratings for the three lines.

[1] For each of the three lines, the continuous and emergency ratings are the same.
[2] Summer refers to calendar months December, January and February. Winter (Non Summer) refers to calendar months March to November.
[3] Day rating applies between 0610 hrs and 2105 hrs.
[4] Night rating applies between 2110 hrs and 0605 hrs.

Table 3 Hand-dressed ratings

66 kV lines	Hand-dressed rating (Winter Day)
Ballarat North – Buangor	34.9 MVA
Ararat – Buangor	47.4 MVA
Ararat – Stawell	43.4 MVA

AEMO completed the ratings quality assurance review for the three 66 kV lines and loaded the new ratings into the EMS database, but did not remove the hand-dressed ratings for those lines until 13 January 2015. Summer ratings for those lines should have applied from 1 December 2014, but the hand-dressed ratings continued to overwrite the summer ratings in National Electricity Market Dispatch Engine (NEMDE) constraint equations during that period.

While this did not affect power system security, AEMO made a scheduling error by incorrectly applying hand-dressed winter ratings for the three 66 kV lines from 0400 hrs on 1 December 2014 to 0905 hrs on 13 January 2015.

2.3 Market Impact

To assess the market impact due to the scheduling error, AEMO did a simulated rerun of NEMDE Dispatch files between 0405 hrs on 1 December 2014 to 0905 hrs on 13 January 2015 (12,445 Dispatch Intervals), replacing the incorrect hand-dressed ratings with the correct summer ratings. The constraint, interconnector and generator target outcomes from the simulated run are summarised in Section 2.3.1, Section 2.3.2 and Section 2.3.3.

2.3.1 Constraint Equations

The limits (RHS) for the following constraint equations were affected by the scheduling error.

Table 4 Affected constraint equations

Constraint Equations	Rating term on RHS of constraint equation
V>>SML_NIL_7A	Ballarat North – Buangor 66 kV line emergency rating
V>>SML_NIL_7B	Ararat – Buangor 66 kV line emergency rating
V>>SML_NIL_7C	Ararat – Stawell 66 kV line emergency rating
V>>SML_NIL_CONT_7A	Ballarat North – Buangor 66 kV line continuous rating
V>>SML_NIL_CONT_7B	Ararat – Buangor 66 kV line continuous rating
V>>SML_NIL_CONT_7C	Ararat – Stawell 66 kV line continuous rating

Only two of the constraint equations (V>>SML_NIL_7A and V>>SML_NIL_7B) were observed to bind (actively influence central dispatch process outcomes) in the original run (with the incorrect winter ratings) or simulated run (with the correct summer rating) during the scheduling error period.

The V>>SML_NIL_7A is a system normal constraint equation that prevents overload of Ballarat North–Buangor 66 kV line for loss of the Ballarat–Waubra–Horsham 220 kV line. The V>>SML_NIL_7B is a system normal constraint equation that prevents overload of Ararat–Buangor 66 kV line for loss of the Ballarat–Waubra–Horsham 220 kV line.

The two constraint equations were observed to bind for 1595 Dispatch Intervals (DIs), which include all DIs when the equations bound in either the original or simulated runs. The market impact has been assessed for all the 1595 DIs.

Appendix A provides the formulation for the V>>SML_NIL_7A and V_SML_NIL_7B constraint equations.

Table 5 shows the dates that the affected constraint equations were binding in the simulated or original run, and the number of DIs involved.

Table 5 No. of Dispatch Intervals when constraints bound during scheduling error period

Date	No. of Dispatch Intervals when V>>SML_NIL_7A and V>>SML_NIL_7B equations bound
02/12/2014	33
03/12/2014	17
09/12/2014	64
10/12/2014	18
12/12/2014	1
13/12/2014	9
14/12/2014	52
15/12/2014	88
17/12/2014	3
19/12/2014	2
20/12/2014	84
21/12/2014	66
22/12/2014	121
24/12/2014	56
25/12/2014	2
27/12/2014	50
28/12/2014	90
30/12/2014	3
31/12/2014	63
01/01/2015	35
02/01/2015	109
03/01/2015	153
05/01/2015	85
06/01/2015	149
07/01/2015	134
08/01/2015	103
09/01/2015	2
12/01/2015	3
Total	**1595**

2.3.2 Interconnectors

The flow trend across the different interconnectors in the simulated run (with correct summer ratings) indicated that, generally, the flow north from the southern regions (VIC, SA and TAS) reduced whereas the flow south from the northern regions (NSW and QLD) increased as compared to the original run (with

incorrect winter ratings). The flow trend across each interconnector for the DIs when the V>>SML_NIL_7A or V>>SML_NIL_7B constraint equations bound is detailed below.

VIC – NSW:

In the simulated run, the number of binding DIs with target VIC-NSW flow towards NSW reduced compared to the original run, whereas the number of binding DIs with target flow towards VIC increased.

The VIC-NSW interconnector (in the VIC to NSW direction) is one of the terms on the LHS of the V>>SML_NIL_7A and V>>SML_NIL_7B constraint equations (Refer Appendix A) with co-efficients of +0.1016 and +0.1037, respectively. With the correct summer rating applied, the RHS of the constraint equations in the simulated run is more restrictive thus limiting the export from VIC to NSW.

Table 6 No. of binding DIs when VIC-NSW is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
VIC ->NSW (Export)	1457	1567
NSW -> VIC (Import)	138	28

Murraylink (V-S-MNSP1):

In the simulated run, the number of binding DIs with target Murraylink flow towards SA reduced compared to the original run, whereas the number of binding DIs with target flow towards VIC increased.

The Murraylink interconnector (in the VIC to SA direction) is one of the terms on the LHS of the V>>SML_NIL_7A and V>>SML_NIL_7B constraint equations (Refer Appendix A) with a co-efficient of +1. With the correct summer rating applied, the RHS of the constraint equations in the simulated run is more restrictive, thus increasing the limitation of export from VIC to SA.

Table 7 No. of binding DIs when Murraylink is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
VIC ->SA (Export)	170	616
SA -> VIC (Import)	1425	979

QNI (NSW1-QLD1):

In the simulated run, the number of binding DIs with target QNI flow towards QLD reduced compared to the original run, whereas the number of DIs with target flow towards NSW increased.

Table 8 No. of binding DIs when QNI is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
NSW ->QLD (Export)	109	127
QLD -> NSW (Import)	1486	1468

Directlink (N-Q-MNSP1):

Similar to QNI, the number of DIs with target Directlink flow towards QLD reduced compared to the original run, whereas the number of DIs with target flow towards NSW increased.

Table 9 No. of binding DIs when Directlink is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
NSW ->QLD (Export)	19	42
QLD -> NSW (Import)	1576	1553

Heywood (V-SA):

In the simulated run, the number of binding DIs with target Heywood flow towards VIC reduced compared to the original run, whereas the number of DIs with target flow towards SA increased.

Table 10 No. of binding DIs when Heywood is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
VIC ->SA (Export)	1431	1372
SA -> VIC (Import)	164	223

Basslink (T-V-MNSP1):

In the simulated run, the number of binding DIs with target Basslink flow towards VIC reduced compared to the original run, whereas the number of DIs with target flow towards TAS increased.

Table 11 No. of binding DIs when Murraylink is exporting or importing

Flow Direction	Simulated Run – No. of binding DIs when flow is in this direction	Original Run – No. of binding DIs when flow is in this direction
TAS ->VIC (Export)	329	404
VIC -> TAS (Import)	1266	1191

2.3.3 Generators

A total of 62,577 MWh of generation was constrained off[5] across all regions in the NEM due to the scheduling error. The constrained-off MWh in each region is listed in Table 12.

The constrained-off MWh for each scheduled and semi-scheduled generating unit in the NEM is provided in Appendix B. It is determined based on the difference in targets between the simulated run and the original run for each of the generating units. In accordance with NER clause 3.16.2(d), only generating

[5] In respect of a generating unit, constrained-off energy is the state where, due to a constraint on a network, the output of that generating unit is limited below the level to which it would otherwise have been dispatched by AEMO on the basis of its dispatch offer.

units that would have been dispatched higher in the simulated run for each trading interval of the scheduling error period have been considered in determining the constrained-off MWh.

Table 12 Generation constrained off in each region

Region	Constrained-off MWh
NSW	23,878
QLD	7,095
SA	7,266
TAS	4,304
VIC	20,035

Note that the LHS of the V>>SML_NIL_7A and V>>SML_NIL_7B constraint equations include Murray generation term (Refer Appendix A) with co-efficients of -0.1016 and -0.1037, respectively. With the correct summer ratings applied, the RHS of the constraint equations are more restrictive in the simulated run. Due to the negative LHS co-efficient, Murray generation is dispatched higher in the simulated run for a number of DIs to prevent violation of the constraint equations and is considered constrained off due to the scheduling error.

The LHS of the V>>SML_NIL_7B constraint equations also include Mt Mercer and Oaklands Hill Wind Farm terms with co-efficients of +0.0845 and +0.0801, respectively. Due to the positive co-efficients and the more restrictive RHS of the constraint equations, these wind farms are dispatched lower in the simulated run as compared to the original run.

3. ASSESSMENT OF THE ERROR

3.1 Assessment against Criteria for a Scheduling Error

Under NER clause 3.8.24(a)(2), a scheduling error occurs when AEMO determines that it has failed to follow the central dispatch process set out in rule 3.8.

In this case, AEMO has determined that its procedures for applying ratings in dispatch were not correctly followed and AEMO declares that a scheduling error has occurred from 1 December 2014 to 13 January 2015.

3.2 Outcomes

Under NER clause 3.16.2(a), Market Participants affected by a scheduling error may apply to the dispute resolution panel established under NER clause 8.2.6A for a determination on whether they are entitled to compensation.

4. RESULTING ACTIONS

AEMO rectified the error by removing the hand-dressing on 13 January 2015.

AEMO has made the following changes to improve the process of applying ratings:

- A new AEMO process guide is being developed to confirm delineated responsibilities. This internal process guide is expected to be completed by August 2015.
- Steps have been added to checklists to ensure that hand-dressed ratings are removed when new ratings are loaded into the EMS database. This action item has been implemented.

APPENDIX A. CONSTRAINT FORMULATION FOR BINDING CONSTRAINT EQUATIONS

A.1 V>>SML_NIL_7A formulation

Constraint type: LHS<=RHS

Effective date: 22/01/2015

Author: ANDREWG

Version No: 1

Weight: 30

Constraint active in: Dispatch and DS PASA, Predispatch and PD PASA,

5 Min Predispatch RHS: Predispatch

Constraint description: Out = Nil, avoid O/L Ballarat North to Buangor 66 kV line for loss of the Ballarat to Waubra to Horsham 220 kV line

Impact: Victorian Generation + Interconnectors

Source: AEMO

Limit type: Thermal

Reason: Avoid overload on the Ballarat North to Buangor 66 kV line for loss of the Ballarat to Horsham 220 kV line

Modifications: Updated PD calcs for load at HOTS, STL, ART, BAN. Improve alignment with DS

Additional Notes: VENCorp limit advice 7/12/2007. For Murraylink flow VIC to SA VFRB scheme will reduce Murraylink to 0 transfer following BATS-WBTS-HOTS line trip.

LHS=

-0.1016 x Murray hydro (14 aggregated units) (ENERGY)
+ MW flow west on the Murraylink DC Interconnector
0.1016 x MW flow north on the Vic to NSW AC Interconnector

RHS

Default RHS value = 0

Dispatch RHS =

153.1 {INTERCEPT}
+ 10.01 x [Victoria: BAN to BGR 66 kV line Emergency Rating]
- 5 {Operating_Margin}
+ 7.501 x [MW summation of the Challicum wind farm output]
+ 0.2011 x [MW Load at Shepparton]
+ 0.2811 x ((-1 x [Sum of 66 kV txfmr MW at BATS]
- MW on BATS to BAN No. 1 66 kV line at BATS
- MW on BATS to BAN No. 2 66 kV line at BATS
+ Ballarat North 66 kV substation loads MW))
- 4.808 x [Ararat 66 kV substation loads]
- 3.805 x [Stawell 66 kV substation MW load]
- 2.163 x ((-1 x [Sum of 66 kV txfmr MW at HOTS]

- MW flow on the Horsham - Stawell 66 kV line no.1
- MW flow on the Horsham - Stawell 66 kV line no.2))
- 0.2292 x [MW Load at Bendigo]
+ 0.2292 x [Fosterville 11 kV substation loads]
- 0.6332 x [MW Load at Kerang]
+ 0.9037 x [MW Load at Wemen]
- MW Load at Red Cliffs
- 0.8721 x [MW flow on X2 220 kV line at Buronga, Line end switched MW]
- 6.96E-06 x ([MW flow north on the Vic to NSW AC Interconnector]) 2
- 0.04566 x [Summated MW loads at Yass, Wagga, Jindera, Darlington Pt & Broken Hill]
- 13.1093 {Confidence Level}
- 0.1016 x [MW load on Pumps at Jindabyne]
+ Generic Equation: BA-HO_66-LNK_STATUS
+ ((((if
MW flow west on the Murraylink DC Interconnector <= 0
Then
0
Else
1)
x (Enable status of Victorian Murraylink very fast runback A scheme))
x (Enable status of Victorian Murraylink very fast runback B scheme))
x (MW flow west on the Murraylink DC Interconnector))

A.2 V>>SML_NIL_7B formulation

Constraint type: LHS<=RHS

Effective date: 22/01/2015

Author: ANDREWG

Version No: 1

Weight: 30

Constraint active in: Dispatch and DS PASA, Predispatch and PD PASA

5 Min Predispatch RHS: Predispatch

Constraint description: Out = Nil, avoid O/L Buangor to Ararat 66 kV line for loss of the Ballarat to Waubra to Horsham 220 kV line

Impact: Victorian Generation + Interconnectors

Source: AEMO

Limit type: Thermal

Reason: Avoid overload on the Buangor to Ararat 66kV line for loss of the Ballarat to Horsham 220 kV line

Modifications: Updated PD calcs for load at HOTS, STL, ART, BAN. Improve alignment with DS

Additional Notes: VENCorp limit advice 7/12/2007. For Murraylink flow VIC to SA VFRB scheme will reduce Murraylink to 0 transfer following BATS-WBTS-HOTS line trip.

LHS=

-0.1037 x Murray hydro (14 aggregated units) (ENERGY)
0.0845 x Mt Mercer wind farm (ENERGY)
0.0801 x Oaklands Hill wind farm (ENERGY)

+ MW flow west on the Murraylink DC Interconnector
0.1037 x MW flow north on the Vic to NSW AC Interconnector

RHS

Default RHS value = 0

Dispatch RHS=

136.1 {INTERCEPT}
+ 11.59 x [Victoria: ART to BGR 66 kV line Emergency Rating]
- 5 {Operating_Margin}
- 6.794 x [MW summation of the Challicum wind farm output]
+ 0.02241 x ([MW summation of the Challicum wind farm output]) 2
+ 0.1337 x [MW Load at Shepparton]
+ 0.5105 x ((-1 x [Sum of 66 kV txfmr MW at BATS]
- MW on BATS to BAN No. 1 66 kV line at BATS
- MW on BATS to BAN No. 2 66 kV line at BATS
+ Ballarat North 66 kV substation loads MW))
- 6.014 x [Ararat 66 kV substation loads]
- 4.347 x [Stawell 66 kV substation MW load]
- 2.441 x ((-1 x [Sum of 66 kV txfmr MW at HOTS]
- MW flow on the Horsham - Stawell 66 kV line no.1
- MW flow on the Horsham - Stawell 66 kV line no.2))
- 0.2125 x [MW Load at Bendigo]
+ 0.2125 x [Fosterville 11 kV substation loads]
- 0.5229 x [MW Load at Kerang]
+ 0.8748 x [MW Load at Wemen]
- MW Load at Red Cliffs
- 0.9084 x [MW flow on X2 220 kV line at Buronga, Line end switched MW]
- 7.41E-06 x ([MW flow north on the Vic to NSW AC Interconnector]) 2
- 0.03713 x [Summated MW loads at Yass, Wagga, Jindera, Darlington Pt & Broken Hill]
+ 0.0801 x [MW load at Terang. 66 kV txfmr flow plus output of Yambuk, Oaklands Hill and Mortons Lane wind farms]
- 0.0801 x [SCADA MW for Yambuk wind farm]
- 0.0801 x [Mortons Lane Wind Farm MW]
- 11.0946 {Confidence Level}
- 0.1037 x [MW load on Pumps at Jindabyne]
+ Generic Equation: BA-HO_66-LNK_STATUS
+ ((((if
MW flow west on the Murraylink DC Interconnector <= 0
then
0
else
1)
x (Enable status of Victorian Murraylink very fast runback A scheme))
x (Enable status of Victorian Murraylink very fast runback B scheme))
x (MW flow west on the Murraylink DC Interconnector))

APPENDIX B. MWH CONSTRAINED OFF FOR EACH GENERATING UNIT

B.1 New South Wales

DUID	Constrained-off MWh
TUMUT3	12,220
UPPTUMUT	3,744
VP5	805
BW03	724
VP6	622
ER01	609
MP1	589
BW04	568
BW02	567
ER04	555
LD04	520
ER02	463
BW01	428
MP2	417
LD02	299
ER03	281
SHGEN	272
TALWA1	78
GUTHEGA	54
URANQ12	20
URANQ13	15
URANQ11	9
LD03	6
SITHE01	5
CG4	5
URANQ14	3
BLOWERNG	0
CG3	0
BOCORWF1	-
CG1	-
CG2	-
GULLRWF1	-
GUNNING1	-
HUMENSW	-
HVGTS	-
LD01	-
TARALGA1	-
WOODLWN1	-

B.2 Queensland

DUID	Constrained-off MWh
GSTONE5	747
GSTONE6	730
GSTONE4	675
GSTONE2	426
BRAEMAR2	354
OAKEY1	347
TARONG#3	318
BRAEMAR1	276
W/HOE#1	260
YABULU	248
OAKEY2	214
BRAEMAR7	194
BRAEMAR5	192
TARONG#4	186
TARONG#1	182
DDPS1	168
STAN-2	168
BRAEMAR3	147
CALL_B_2	147
MPP_2	138
GSTONE1	135
STAN-1	134
STAN-4	110
GSTONE3	109
STAN-3	98
CPP_4	91
CPP_3	61
KPP_1	49
CALL_B_1	47
TNPS1	35
CPSA	30
KAREEYA2	16
BARRON-2	13
MPP_1	11
KAREEYA4	11
BARRON-1	8
KAREEYA1	5
BARCALDN	4
ROMA_7	3
ROMA_8	3
MSTUART2	1

DUID	Constrained-off MWh
KAREEYA3	1
MACKAYGT	1
BRAEMAR6	-
MSTUART1	-
MSTUART3	-
SWAN_E	-
TARONG#2	-
W/HOE#2	-
YABULU2	-
YARWUN_1	-

B.3 South Australia

DUID	Constrained-off MWh
TORRB2	1,207
TORRB1	1,012
TORRB3	897
TORRB4	750
NPS2	723
NPS1	601
PPCCGT	506
TORRA2	393
AGLHAL	349
TORRA3	263
LKBONNY2	76
DRYCGT2	66
TORRA4	62
TORRA1	61
DRYCGT1	60
MINTARO	47
DRYCGT3	41
OSB-AG	38
QPS5	29
HALLWF2	17
NBHWF1	14
LKBONNY3	11
BLUFF1	8
QPS4	7
QPS1	7
QPS3	6
HALLWF1	6
QPS2	5
LADBROK1	2
LADBROK2	2

DUID	Constrained-off MWh
SNUG1	0
SNOWNTH1	0
CLEMGPWF	-
PLAYB-AG	-
POR01	-
POR03	-
SNOWSTH1	-
SNOWTWN1	-
WATERLWF	-

B.4 Tasmania

DUID	Constrained-off MWh
GORDON	1,458
POAT220	653
TARRALEA	561
POAT110	545
TREVALLN	362
TUNGATIN	337
REECE2	69
JBUTTERS	67
CETHANA	60
DEVILS_G	52
LI_WY_CA	38
MACKNTSH	25
TRIBUTE	23
LEM_WIL	19
MUSSELR1	19
BASTYAN	16
TVPP104	-
BBTHREE1	-
BBTHREE2	-
BBTHREE3	-
FISHER	-
LK_ECHO	-
MEADOWBK	-
REECE1	-
TVCC201	-

B.5 Victoria

DUID	Constrained-off MWh
MURRAY	12,766

DUID	Constrained-off MWh
NPS	1,989
MCKAY1	1,605
APS	392
LOYYB2	383
YWPS3	313
LYA3	208
LOYYB1	206
YWPS2	177
YWPS1	168
EILDON2	160
YWPS4	157
DARTM1	149
OAKLAND1	147
WKIEWA1	132
HWPS7	129
WKIEWA2	120
LYA2	100
EILDON1	97
HUMEV	94
LYA1	93
MORTLK12	68
LYA4	67
AGLSOM	55
LAVNORTH	53
MACARTH1	37
HWPS3	32
HWPS5	31
MORTLK11	17
HWPS4	16
HWPS1	12
BDL02	11
HWPS8	10
HWPS2	9
JLB01	9
HWPS6	6
JLB03	6
MOR3	5
JLA02	3
MERCER01	3
BDL01	1
JLA01	-
JLA03	-
JLA04	-

DUID	Constrained-off MWh
JLB02	-
MOR1	-
MOR2	-

ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
DI	Dispatch Interval
EMS	Energy Management System
kV	Kilovolt
LHS	Left Hand Side
MNSP	Market Network Service Provider
MW	Megawatt
MWH	Megawatt Hour
NEM	National Electricity Market
NER	National Electricity Rules
NSW	New South Wales
NSW1-QLD1	New South Wales – Queensland Interconnector
N-Q-MNSP1	Directlink Interconnector
QLD	Queensland
QNI	Queensland – New South Wales Interconnector
RHS	Right Hand Side
SA	South Australia
TAS	Tasmania
TNSP	Transmission Network Service Provider
T-V-MNSP1	Basslink Interconnector (MNSP)
VIC	Victoria
VIC–NSW	Victoria – New South Wales Interconnector
V–SA	Victoria – South Australia Interconnector
V-S-MNSP1	Murraylink Interconnector

GLOSSARY

Term	Definition
DI	Dispatch Interval
DIs	Dispatch Intervals
Hand-Dress	Limits applied manually to overwrite automatically-generated rating values elicited from the Energy Management System database every five minutes.
Rating	Describes an aspect of a network element's operating parameters, including categories like current-carrying capability, maximum voltage rating, and maximum fault level interrupting and withstand capability. Network elements must always be operated within their ratings. Network elements may have rating that depend on time duration (such as short-term current-carrying capacity.)
Scheduling Error	As defined in NER clause 3.8.24